

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

Claim 1 (currently amended): A method for fabricating a ground-ball bonding structure on a TBGA (tape ball grid array) package constructed on a heat sink and a solder-unwettable tape, the method comprising the steps of:

- (1) forming a via hole in the tape to expose a selected part of the heat sink;
- (2) forming a ring-shaped ground-ball pad over the tape and around the via hole, the ring-shaped ground-ball pad being formed with a plurality of air vents spaced substantially at equal radial intervals around the via hole and cut all the way into the tape until reaching the heat sink;
- (3) forming a solder mask over the tape while unmasking the ring-shaped ground-ball pad, wherein a distance between outermost edges of the air vents is at least equal to greater than a diameter of the unmasked ring-shaped ground-ball pad, so as to form an interspaced ring of the ground-ball pad and allow each of the air vents to extend outwardly from the via hole to a position beneath the solder mask;
- (4) performing a solder-pasting process to paste a solder material through the solder mask into the via hole, and wherein during the solder-pasting process, air-filled voids are undesirably left in the via hole;
- (5) performing a first solder-reflow process to reflow the pasted solder material in the via hole, and wherein during the first solder-reflow process, the solder material is wetted to the unmasked interspaced ring of the ground-ball pad and prevented from being wetted to the solder-unwettable tape encompassing the air vents, thereby making air in the air-filled voids would substantially be drawn via the air vents to outside atmosphere, thereby and allowing the pasted solder material to substantially fill up the entire void space of the via hole;
- (6) attaching a solder ball by means of a solder flux to the pasted solder material in the via hole; and
- (7) performing a second solder-reflow process so as to reflow the solder ball, the solder flux, and the solder paste material into an integral body of solder wetted to the ring-shaped ground-ball pad to serve as a ground ball connected to the heat sink.

Claim 2 (previously amended): The method of claim 1, wherein in said step (2), the ground-ball pad is formed with two air vents spaced substantially at 180° intervals around the via hole.

Claim 3 (previously amended): The method of claim 1, wherein in said step (2), the ground-ball pad is formed with three air vents spaced substantially at 120° intervals around the via hole.

Claim 4 (previously amended): The method of claim 1, wherein in said step (2), the ground-ball pad is formed with four air vents spaced substantially at 90° intervals around the via hole.

Claim 5 (currently amended): A TBGA (tape ball grid array) package configuration, comprising:

- (a) a heat sink;
- (b) a solder-unwettable tape mounted over the heat sink and formed with a via hole to expose a selected part of the heat sink;
- (c) a ring-shaped ground-ball pad formed over the tape and around the via hole, the ring-shaped ground-ball pad being formed with a plurality of air vents spaced substantially at equal radial intervals around the via hole and cut all the way into the tape until reaching the heat sink, the air vents being used to facilitate ~~the drainage of trapped air in the via hole to outside atmosphere due to a solder material being filled into the via hole to outside atmosphere during a solder reflow process and prevented from being wetted to the solder-unwettable tape encompassing the air vents~~; and
- (d) a solder mask formed over the tape while unmasking the ring-shaped ground-ball pad, wherein a distance between outermost edges of the air vents is ~~at least equal to~~^{greater than} a diameter of the unmasked ring-shaped ground-ball pad, so as to form an interspaced ring of the ground-ball pad and allow each of the air vents to extend outwardly from the via hole to a position beneath the solder mask.

Claim 6 (previously amended): The TBGA package configuration of claim 5, wherein the ring-shaped ground-ball pad is formed with two air vents spaced substantially at 180° intervals around the via hole.

Claim 7 (previously amended): The TBGA package configuration of claim 5, wherein the ring-shaped ground-ball pad is formed with three air vents spaced substantially at 120° intervals around the via hole.

Claim 8 (previously amended): The TBGA package configuration of claim 5, wherein the ring-shaped ground-ball pad is formed with four air vents spaced substantially at 90° intervals around the via hole.

Claim 9 (canceled)

Claim 10 (canceled)